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IS 6882 (1973): Platinum electrodes [MTD 10: Precious Metals]

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SPECIFICATION FOR PLATINUM ELECTRODES

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110001

October 1973

Indian Standard

SPECIFICATION FOR PLATINUM ELECTRODES

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Indian Standard

SPECIFICATION FOR PLATINUM ELECTRODES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 5 March 1973, after the draft finalized by the Precious Metals Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Platinum electrodes are used for electrochemical analysis in laboratories. Generally, electrode cylinders are made of gauze as it provides greater surface area than equal weight of plain or perforated sheet. This allows the electrolyte to circulate much more freely. Wherever agitation of the electrolyte is required in order to save time of deposition, one of the rotating type of electrodes is used. Since variety of electrodes are used by laboratories, need was felt to rationalize the types of electrodes most commonly used.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements for purity, size, and shape of platinum electrodes employed in electrochemical methods of analysis.

2. PURITY OF MATERIAL

2.1 Composition of platinum-iridium alloy used for the electrodes shall be 90 percent platinum and 10 percent iridium. Tolerance on platinum and iridium shall be ± 0·3 percent each. The total impurities other than platinum group metals shall, however, not exceed 0·1 percent maximum, out of which iron shall be 0·05 percent maximum.

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*Rules for rounding off numerical values (*revised*).

3. FINISH

3.1 The surface of the platinum electrodes shall be smooth and clean to promote uniform deposition and good adherence.

4. ELECTRODES

4.1 Cathode — This may be formed from wire gauze and may be close cylinders. Gauze cathode shall be made preferably from 48 mesh gauze woven from wire approximately 0·15 mm in diameter. The cathode shall be stiffened by doubling the gauze for about 3 mm at the top and the bottom or by reinforcing the gauze at the top and the bottom with platinum-10 percent iridium frame. The gauze shall be tightly fitting to the cylinder frame. The stem shall be made of platinum-10 percent iridium alloy. It should be flattened and welded along the entire length of the gauze.

4.2 Anode — The anode shall be of the following three types:

a) *Gauze Type* — Where simultaneous determination of copper and lead is required, the anode should be wire gauze. Platinum gauze anode should be made of the same material and of the same general design as platinum gauze cathode (*see* Fig. 1 to 3).

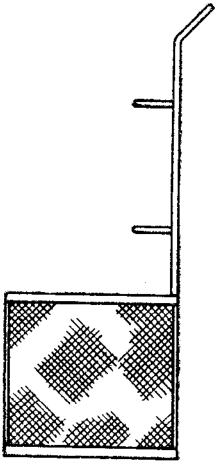

Fig. 1 E1 Platinum Electrode, Gauze Type

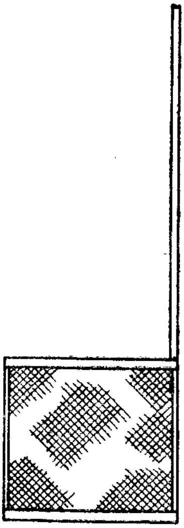

FIG. 2 E2 PLATINUM ELECTRODE, GAUZE TYPE

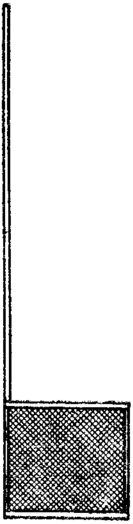

FIG. 3 E3 PLATINUM ELECTRODE, GAUZE TYPE

b) *Spiral Type* — This type of anode is used when anodic deposits are not being determined or if the deposits are small (as in the case of electrolytic determination of lead when it is present in amounts not over 0·2 percent). The anode should be made from 1·5 mm of platinum-10 percent iridium wire and formed into spiral of turns (*see* Fig. 4).

c) *Paddle Type* — This type of anode is generally used in the determination of lead as deposit. The anode also serves as stirrer in the process (*see* Fig. 5).

5. DIMENSIONS

5.1 The dimensions of electrodes, namely, E1, E2, E3, E4 and E5 are given in Table 1. The shapes of electrodes E1, E2, E3, E4 and E5 are illustrated in Fig. 1 to 5 respectively. The tolerance on weight of the electrode shall be ± 5 percent.

TABLE 1 DIMENSIONS OF PLATINUM ELECTRODES

SIZE	E1	E2	E3	E4	E5
Height, overall, mm	125	150	140	140	140
Height of cylinder helix, mm	45	45	32	30	—
Diameter of cylinder helix, mm	45	45	32	10	—
Approximate weight, g	34	31	19	10	13
Approximate surface area, cm^2	125	125	70	0·35	18
Paddle	—	—	—	—	30 × 30 mm

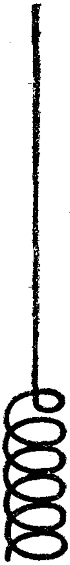

Fig. 4 E4 Platinum Electrode, Spiral Type

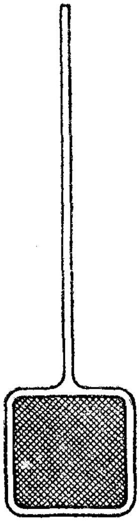

Fig. 5 E5 Platinum Electrode, Paddle Type

6. TESTING

6.1 Platinum and iridium content of the electrodes shall be determined in accordance with methods given in IS : 2270-1965*.

7. MARKING

7.1 Electrodes shall be marked with the manufacturer's name or trade-mark.

7.1.1 The platinum electrode may also be marked with the ISI Certification Mark.

Note — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

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*Methods for assaying of platinum and platinum alloys.

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2271-1967	Recommended method for spectrographic analysis of platinum
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3571-1966	Dental gold solders
3578-1966	Dental gold alloy wire
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4705-1968	Dental mercury
4799-1968	Dental casting gold alloys
5954-1970	Dental white gold alloys
6018-1970	Platinum, platinum-rhodium catalyst gauzes
6019-1970	Platinum-dish
6170-1971	Platinum crucible and lid

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